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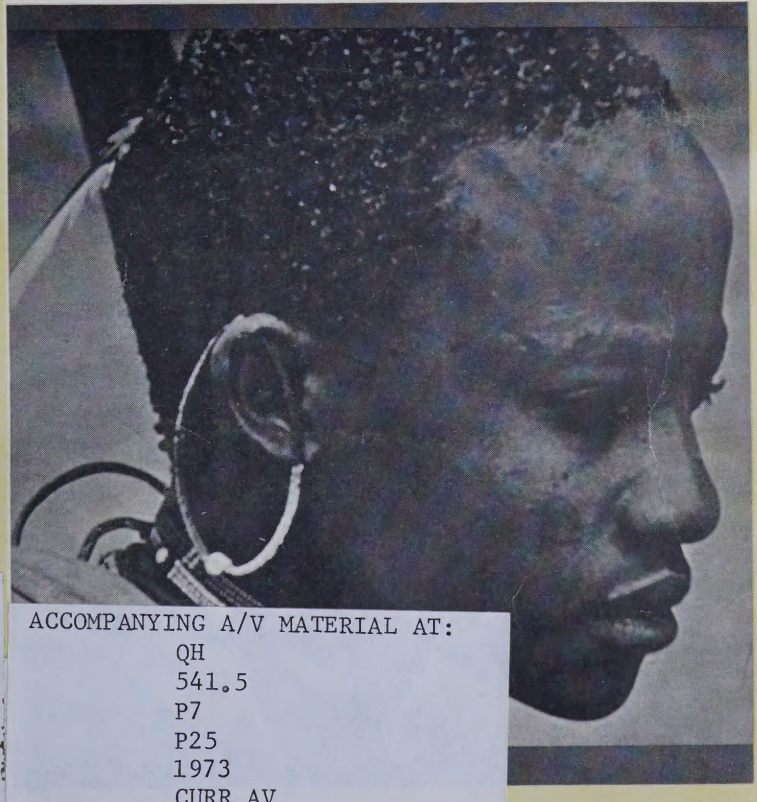
Teachers' Guide
Grassland Safari

Grassland Safari

MAN IN HIS WORLD



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MAN IN HIS WORLD

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Teachers' Guide
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OUTLINE

PAGE 3 THE ENERGY CYCLE

Because the sun is the principal source of energy for living things on earth, it is safe to say that *all* stories on earth start "93 million miles away in space". Every phrase in the first two paragraphs is meaningful and important, and can be profitably discussed with students. For example, the sun is a star and, as stars go, it is small and it is aging. The teacher can also explore the concept of atoms, and note the fact that atomic interactions can result in a flow of energy which can travel through space. Key words, such as "energy", can be explored at length, and simple experiments can be used to show different kinds of energy (light, sound, heat, etc.). The idea that it is atomic energy from a distant star that enables us to live is of basic importance.

Ideas about space, and the vast distances that measure the depths of space, are worth exploring. The fact that it takes light 8 minutes to reach the earth from the sun can be used to develop thoughts on the speed of light. Questions based on how long it would take a spaceship to reach the sun can then be offered as contrast (with the ship travelling at 100, 1,000, 10,000, or 100,000 m.p.h.). Another basic concept to establish at this point is that the earth is a *planet*, and a *small* planet, compared to some of the giants of the solar system.

The process of photosynthesis, the absorption by plants containing chlorophyll of radiant energy from the sun to convert water from the ground and carbon dioxide from the air into food, is introduced in the second paragraph. The top photograph shows the sun's corona, viewed during an eclipse through a special telescope. The bottom photo shows the earth viewed from space. Students can be asked to point out Africa, Arabia, the Mediterranean; to locate the sun in relation to the earth in this picture; and to think about what time it might be in east Africa, and at what time of year the picture was taken (according to the tilt of the earth). This will lead to discussion of the seasons and the earth's rotation.

The "Did You Know?" statements here suggest the enormous amount of energy that falls on the earth from the sun. Students can consider what a small percentage of the total amount of solar energy this represents. The second statement provides students with some understanding of the vast scale of astronomic time.

PAGE 4

Photosynthesis is the most important chemical reaction on earth for human beings. Students might be asked how the sun's energy reaches us. A series of food chains can be shown in diagrammatic form, and simple practical studies can be made in aquaria or pond water samples. On this planet, all living things must use oxygen to release energy from food, after which carbon dioxide is given off. Some simple experiments can be performed to show that plants, like animals, do give off oxygen.

The "Did You Know?" statements can be verified by experiment, and students should enlarge on the ideas presented (e.g. changing the intensity of light, the colour of light, the duration of light).

The experiments suggested on this page should be considered as starting points, and students should be involved in the planning whenever possible.

1. This represents the standard test for starch; students should investigate a variety of objects and materials for the presence of starch.
2. The leaf is boiled without rupturing the cells, thus freeing the starch. Boiling the leaf in alcohol extracts the chlorophyll from the cells, so that the starch can be detected.
3. One plant is used as a control. The small container under the second jar could contain something like water. The results of the experiment should indicate that carbon dioxide is necessary for the production of starch.

PAGE 5

This story opens many avenues for class discussion. It will become clear that any organism that moves is probably an animal. Students can explore the meaning of the word "organism," the similarities between plants and animals, and the habits of herbivores as contrasted with those of carnivores and scavengers. In examining the lion as part of the cat family, they can discuss ideas about what makes the lion a predator. The method of stalking and killing is much the same for a house cat hunting a sparrow and a lion attacking a zebra.

A TURN FOR THE VERSE

Students might be encouraged to write poetry or stories of their own about the animals of Africa.

PAGE 6 THINGS TO DO

1. Have students diagram some of the food chains common to the African grassland, or North America, or involving themselves. The parenthetical remark underlines the earth's dependence on energy generated by the interaction of atoms in the sun.
2. The Crooke's radiometer, pictured on the left, is an inexpensive device, which can probably

be borrowed from a nearby secondary school. Students might be asked to investigate the effects on the radiometer of various types of radiation: radios, different kinds of light, heat. They might also investigate the effect of various materials as radiation shields. An important idea here is the "inverse square" law, the relationship between the intensity of the radiation, and the distance of the radiometer from the source of radiation. This type of exercise lends itself to the development of graphing skills. It is neither necessary nor desirable to labour the concepts of inverse and square. The main point is to arouse the students' curiosity, for example, about the intensity of radiation 93 million miles closer to the sun.

3. Standardizing the thermometers is necessary to deal effectively with this experiment. A grid and co-ordinates can be used to assist in making a "heat map". The concept of 3-dimensional space should be contrasted with a featureless, inexact 2-dimensional study. Questions such as, "How would an engineer improve the heating?" are designed to inspire inquiry more than specific answers.

At the bottom of the page, another detector of radiation is noted: the light meter. Students should investigate the limits of this instrument in detecting other types of radiation. The changes in intensity as one goes away from a source of light provide another instance of the inverse-square law.

PAGE 7 DID YOU KNOW?

Many of these statements could be diagrammed by the students. Students should examine a variety of plants, including grasses, to compare roots, stems, leaves and flowers. Have one group draw two steep slopes. Ask them to cover one with grass, and leave the other unprotected. Discuss the value of grass as a means of conserving soil and slopes. Have another group show how grass, by bending, can withstand high winds. The word "lodging" could be introduced to start discussion of what occasionally happens to heavily laden grain fields. Diagrams to illustrate how grass roots vary in length and spread, reflecting the amount of water in the soil, help emphasize the adaptability of the grass family.

PAGE 7 THINGS TO DO

1. Students might investigate the possibilities of a world without grass plants. For example, there would be no milk if the cow were on a grass-free diet. Would there be bacon and eggs?
2. The idea of a control is again presented. The ability to withstand grazing or mowing is one of the important characteristics of grasses. Students can investigate other varieties of plants in this connection. Ideas about pruning and shaping can be developed.
3. Students should be encouraged to suggest experiments of their own which might test the erosion-resistant capabilities of grasses. The experiment in the book deals with water erosion, but wind erosion could be studied by using a fan. Better than simply watching the difference in runoff, have students measure it, using a simple balance. The quantity of water can be related to the weight of soil carried away, and simple graphs made.
4. This exercise in mathematics has no specifically correct answers. Students might discuss the factors which control the number of seeds produced in an ear of wheat, or weigh the wheat and determine the number of grams, pounds, or tons that would be produced. Volume, expressed in bushels or litres, might also be investigated.

PAGE 8 THE GRASSLAND COMMUNITY

The photos and drawings can be used to begin discussion on:

(a) what "grasses" are, and how they differ from other plants
(b) the names of the grasses shown (wheat, sugar cane, rice) Find other types of grasses not shown here.

PAGE 9

1. Ask the students what name could be given to this map.
2. Have them explain why no title was included.

PAGE 10

For ideas on this sort of exercise, see pages 3-4, Teacher's Guide, *Gifts of the Nile*.

PAGE 11

The animals pictured are the gnu, water buffalo, gazelle, and zebra.

1. This is an opportunity for the students to develop research skills. The exercise could be extended by having the students investigate other grasslands in other parts of the world, and note the fauna there.
2. This exercise develops skills of observation and comparison. The major features which characterize the grassland animals can be noted.

THINGS TO DO

Applied genetics is an important part of modern biology in relation to farming. Students can be asked to indicate what characteristics would promote the survival of grassland plants and animals. They can then discuss what features would be desirable from the point of view of the farmer. It might be noted that the production of various strains of grains is a long process, and that disease-resistant species are often less productive.

BOBBY'S CATTALO — Milton, Ontario
From the HAMILTON SPECTATOR, 1972

A female calf born at Mountsberg game farm is going to get plenty of attention from scientists. It was produced by a three-year-old Holstein cow bred by a buffalo bull, a son of Bashful Bobby.

The cross-bred calf, known as a Cattalo, has many characteristics of the buffalo — 14 ribs, tufts of curly hair and a thick hide. It is darker than either a Holstein calf or a buffalo calf.

Weighing 100 pounds, it is also larger than the average calf of either species.

The cow and buffalo belong to the same group of animals but have developed into ecologically separated species. They have different appearances, dispositions, nutritional needs, breeding habits and responses to climatic conditions. If the two could be cross-bred successfully, offspring would grow faster than cattle, be more resistant to disease, have a thicker hide and withstand hot and cold weather better.

PAGE 12

1. The top left country is Uganda, the top right is Kenya, and the lower country is Tanzania.
2. Tropic of Cancer, Equator, Tropic of Capricorn.

Further discussion could revolve around the importance of the information shown on the map. Have the student suggest what is not shown and why.

PAGE 13

5. The vegetation varies from desert, through a series of forests (evergreen, deciduous, coniferous) to alpine tundra. Students can relate temperature, rainfall, runoff, evaporation and slopes to the growth of natural vegetation.

PAGE 14 THINGS TO DO

Ask students to discuss the factors that would control the rate of evaporation, and then to suggest experiments to verify their predictions. In the first experiment, a similar mass of water (or other liquid) could be placed in each of two identical containers. The stream of air from a fan could be directed over one container while the other is used as a control. From time to time the containers would be reweighed, and the results plotted as a simple line graph. Using the graph, students could make predictions, such as how long it would take to evaporate a given amount of liquid, or what amount of liquid could be evaporated in a given amount of time. In this way the student learns the graphing skills of extrapolation and interpolation, and how a scientist uses a graph to make predictions. He can then proceed to verify these predictions by experiment, perhaps measuring changes in volume as well as in weight.

DID YOU KNOW?

Students might suggest experiments to prove these statements. For instance, different containers of liquid are maintained at different temperatures (perhaps by using a hotplate or electric frying pan) and the difference in the rate of evaporation is noted. The hottest container has the most energy to give to the particles of liquid, and hence the rate of evaporation is greater. Students can evaporate water, perfume or alcohol by putting a drop on their wrists and blowing across it. The energy which the particles need in order to evaporate is taken from the skin, and as a result the wrist feels cool. In connection with the bottom diagram, students might speculate about the factors that would promote the "escape" of particles from the liquid in the saucer. The moderating effects of large bodies of water on climate could be related to these statements.

The last statement directs the students' attention to the water cycle pictured on page 15. The fact that the water cycle is a closed system might be emphasized, along with the idea that the earth has neither more nor less water than when it began. Students can consider the ecological effects on this planet of human treatment of its water.

PAGE 16

1. Cloudy and wet
2. Sunny and dry
3. Map A
4. Dry season
5. AMJJASO
6. The monsoon-like winds from the Indian Ocean on map A bring moisture.
7. When the winds shift to the south, ceasing to blow off the ocean, the rains diminish. In answering question 7, students might turn to page 18, which could be discussed even before page 16.

Page 17

1,2. Left Diagram — Map B
— dry season with dry winds
— sun is out, clear skies
— grasses are shorter
— no rain falling
Right Diagram — Map A — reverse of above

3. The most suitable time is the dry season, although dust and dryness are not ideal for travelling. In the wet season the dirt roads are almost impassable. Because of the rain and clouds, tourists would not be able to see much scenery or animals, or carry on many outdoor activities.

DID YOU KNOW?

These conditions are quite different from those in most of North America, especially in the more northerly areas where the time of sunset varies several hours from summer to winter. Students could compare such figures with their own home area. Some investigation of the reasons behind these differences would be useful. Students might also be asked to comment on what summers in their home town would be like if the sun set at 6:00 p.m. every day.

PAGE 18

2. He would use "wet and dry season".
3. Probably November to February.
4. As with many questions in *Grassland Safari*, this one allows various answers. There are no right or wrong answers. The questions merely give students a chance to be creative, expressive, and to show preferences. Prediction backed by reason is an excellent teaching method.

PAGE 19

1. Letters represent months of the year.
2. The basic colours of the wet (green) season from May to October, and the dry (brown) season from November to April.
3. The greens indicate that the plants have enough moisture in the rainy or wet season to grow. Due to lack of water in the dry season, the plants have ceased to grow and have dried out, giving the landscape a yellow-brown colour.
4. This paragraph should show an understanding of the tie between the amount of rainfall and the colour of the countryside (with particular stress on plant life). The adaptation of plants to dry (desert) conditions is shown in *Nomacid Journey* (pages 8-9).

PAGE 20

This series of questions can be studied at the same time as the skulls on page 31. If a variety of real skulls are used, students will understand the differences between carnivores and herbivores, and develop other skills in observation and classification. From the picture alone, it is clear that a carnivore is a flesh eater. When the students study the skull of such an animal, examining the well-developed canines and the cutting edges of the other teeth, the nature of the beast becomes clear. The flat, grinding surfaces of the teeth of herbivores contrast with the sharp, tearing teeth of meat-eaters. Most secondary schools have a variety of skulls which the students may examine and classify into groups. There are also omnivorous animals, like man, that combine flesh- and plant-eating habits. The teeth of man suggest this dual purpose.

Children should be encouraged, when examining the questions, to:
(a) use research books
(b) use their imaginations
(c) use their ability to see relationships
(d) use evidence to support beliefs

Questions 5 and 6 are further examples of questions requiring no definitive answers but designed to stimulate worthwhile discussion.

It may be obvious to most youngsters that life on earth would be impossible without green plants to convert the energy of the sun into food. The number of organisms required to support herbivores and carnivores is much less obvious. Students should obtain from this discussion the idea that it takes countless green producers to support a few herbivores, which in turn support only a very few carnivores. This idea can be reinforced by having the students study an aquarium (preferably a closed system) wherein a very large amount of algae is required to support just a few algae-eating fish.

PAGE 21

Scavengers help to complete the "matter" chain, removing dead animals like so much organic litter. From vultures, the discussion could turn to the decomposers which assist in the rotting of plants and animals, and the recycling of the elements they contain into the soil and atmosphere. It is intriguing for youngsters to realize that the atoms of which their bodies are made have always been a part of this planet and its atmosphere.

Physiological adaptations often promote survival. Many young people feel that evolution is a very gradual process, consisting for the giraffe, for instance, of a long series of tiny increases in the length of his neck, passed on from generation to generation until eventually he appeared as we know him today, equipped to view lions and gnaw trees from his hard-earned vantage point. In fact, most scientists agree that evolutionary changes are the result of sudden environmental changes, in the case of the giraffe providing him almost overnight with his unique scanning tower. If these sudden changes promote the survival of the animal, they are incorporated into the fabric of life. If no advantage is gained, the change is merely another of countless deviations that soon die out.

As with all of the *Did You Know?* sections in this book, the important learning comes with discussion. (Why would this be so? What special advantages are conferred by early walking in the case of the herbivores? etc.)

PAGE 23

1. Gnu, impala, wildebeest, cape buffalo, zebra, gazelle, eland, elephant, rhino, giraffes, ostrich.
2. The amount of grassland has diminished. The streams have dried up, some water holes have disappeared. The letters accompanying each diagram should be compared with those on the graph on page 18, and relationships should be mentioned.

PAGES 24-25

1. Area 1
   — Trees are smaller and more scattered.
   — Trees require more moisture than most plants, and thus do not grow in very dry areas.
2. Probably Area 1 since:
(a) it is drier (fewer muddy roads)
(b) it is grass-covered, but grasses are shorter due to lower rainfall
(c) it has fewer trees to get in the way
3. The following phrases might be used to inspire research:
(a) distance from the ocean
(b) elevation above sea level
(c) relief rainfall
(d) rain shadow

PAGE 26

The diagram on the right represents night time. The pupils of the eyes are open wide to catch as much light as possible. This helps him see. The lion may be hunting or just curious about some noise. Many nocturnal animals have eyes that glow as they reflect light, said to be because of a layer of reflective pigment in the eye.

The picture on the left suggests a lazy lion drowsing in the noonday sun.

THINGS TO DO

Try the simple experiments suggested. Questions 3-5 show young people how binocular vision assists them to perceive depth accurately. This is an ability necessary for any good hunter. Since herbivores do not have to catch their food on the run, there is advantage for them in having eyes placed on the sides of the head. In this way they can survey the terrain around and behind them for predators.

The simple experiment in number 9 demonstrates the complexities of equilibrium. Use of the tail is one of the major ways in which members of the cat family maintain their balance. Students might also like to discuss the tail as an indicator of a cat's mood.

PAGE 27

Places on earth where geography has cut off a group of plants and animals from the mainstream of evolution have always fascinated biologists. An interesting outgrowth lesson on developments in Australia or the Galapagos could be incorporated into the work at this time.

Both hunter and hunted have keenly developed senses of smell, hearing and sight. There are some animals, such as the rhinoceros, who are so powerful that they are almost immune from attack, and some of whose senses have consequently weakened. It is always worthwhile for students to study living animals and to compare the various ways they sense their environment. This can be done with simple microscopic animals such as protozoa, or more complex organisms such as guinea pigs and hampsters. Students can record the responses of a variety of animals to changes in light, colour, noise, temperature, etc.

Students should speculate on the pictures in the book. For example: What is this lion doing? Is it a he or a she? What time of day is it? What is the rhino doing? Is he asleep? Dead? Drugged?

PAGE 28

Students should be encouraged to write prose and poetry or to tell stories about the pictures.

The familiar "black box experiment" can be used to develop the student's ability to observe and to show that conclusions should be drawn with great care. Further to this experiment, have students describe and examine a freshly prepared dish of plaster of paris, and pass it around the room. By the time the dish has made the rounds, the characteristics of the plaster of paris have changed. The point is that observations are valid according to the time they were made.

PAGE 29

This "game" could be played in the classroom. Students could use desks as cover and have to employ stealth. If the "gnu" heard or saw anything, the child playing that part could have the right to run for safety.

PAGE 30

The retractable claws of the cat are unique in the animal world. If a cat skeleton can be examined, students can locate the knee, the ankle and the foot.

THINGS TO DO

1,2,3. Some of these experiments provide simple ways for the students to realize the speed and grace of the lion. The investigations could be made more quantitative by having students measure their speed running flat-footed and on the balls of their feet, and compare the two. Measurements of space and time are important in science and here provide basic ideas on motion.

PAGE 30

4. This stalking experiment can be fun, especially if obstacles are set up to make the student's passage toward his "prey" more difficult. It is surprising that man can often "sense" the approach of things he cannot see or hear. The stalker will tend to bend at the waist, hold his head high, spread his arms and tiptoe. These are characteristics shown by the hunting lion.

The pictures of the lion and cheetah could be supplemented by other cat pictures, such as the tiger, puma, leopard and bobcat. Students can compare them and speculate on their relative speed and strength.

PAGE 31

The data shows that the importance of stalking skills increases as the speed of the hunter decreases. Thus the lion, through guile and skill, must get close enough to the impala to surprise it before it can achieve escape velocity. The impala must see the lion early enough to wear the cat down in a chase. Cheetahs, although faster, lack endurance. Man has a long-range capacity for killing. No animal can outrun a bullet travelling at 800 m.p.h.

PAGE 32

Students might discuss the word "extinct", and go to the library to discover other animals that are extinct today. Many of these animals could be selected from the time of the sabre-toothed tiger, and might suggest to the students reasons for the mighty cat's demise. This discussion can lead the class to consider species in danger of becoming extinct today. In discussing the factors that push a species towards extinction, students can explore questions of wildlife conservation, and see how man can help or hinder the evolutionary process.

Conservation of soil, water and forest can be studied at this time and linked to the information on page 61. Students can perform, outdoors, some simple experiments in resource management, such as erosion control by plantings.

In answering the questions on the sabre-toothed tiger, students have an opportunity to hone their research skills. A visit to a local museum will have high motivational value. Teachers themselves do not have to act as repositories of information and suppliers of correct answers.

DID YOU KNOW?

An important aspect of ecology is the occupation by animals of particular niches in their environment. Competition for food and space is usually most severe between members of the same species, or organisms that wish to occupy the same niches. Plants also can observe peaceful co-existence by occupying different niches in the same area. In this way, shade-loving plants live happily among trees and taller plants.

Stated simply, ecology is the study of the interaction of organisms with their environment and with each other. It is important for students to see that severe environmental conditions can force an organism to change his habits. During a drought, for instance, the lion will abandon his territory and migrate with his food supply to water.

1. Have the students discuss the idea of territoriality. Ask them in what ways children, dogs, and nations exhibit this feeling.
2. A comparison with cattle, sheep and goats could be made to show how domesticated animals also reflect different abilities to graze.

PAGE 33

The story can be used to illustrate the many similarities the young of the lion have with young children. The class could also discuss such "human" characteristics as laziness, gregariousness, discipline and love.

PAGE 36

1. Down wind, near a trail, hidden in tall grass or in a treed area.
2. Trial and error is as vital to the lion's learning as to most children'. Examples involving thin ice, hot stoves, objects on stairs, and valuables left outside could be considered. The saying *Experience is the best teacher* might be discussed. What part does our ability to read, write, speak and listen play in making us less reliant upon personal experience?
3. The class should think about the retention of the best of each species because of their ability to survive.

PAGE 37

Have the students define the word "drought". What relationship does the picture have to this definition? Have the students pick out other pictures, maps or diagrams in the book where drought is shown.

PAGE 38

Because man has neither the strength nor the speed to compete on equal terms with the animals of the grassland, he uses his brain to devise ways of overcoming his deficiencies. Tools are the answer he found. Man's intelligence and ability to learn from earlier men enabled him to develop weapons.

The questions in the *Did You Know?* section should be open to discussion. No one answer is correct.

The Masai warrior would most likely take the longest spear and the shield. The ideas on page 48 might be discussed in connection with these questions.

PAGE 39

The Masai characteristics are in part related to their diet. This page might be considered alongside the information given on page 56. See if the students can relate the two.

Some activities that the Masai are physically suited for are hunting, running, playing basketball, making crafts, and playing the piano.

PAGE 41

1. The diagram shows a Masai village.
2. (1). outer thorn bush stockage
   (2). the mud huts of the Masai
   The inner symbols represent a smaller thorn bush corral for cattle with a waterhole in the middle. In working out the above answers, students should study each of the pictures carefully and attempt to relate them to the diagram.
3. Thorn bushes, branches, poles, grass, mud and cow dung were used because they were readily available, easy to work with, and cheap.
4. The "kraal" is designed to protect the Masai tribesmen and their cattle from:

(a) predatory animals such as the lion, leopard, etc.
(b) other tribes who are hostile to the Masai
(c) the weather during the wet season (hot)

5. Kraal — corral. The kraal is used to confine and/or protect cattle, much like a North American corral.

DID YOU KNOW?

The first point shows the concern of the Masai for their cattle, as possessions and as a source of food. See the section on the Masai diet (page 56) and Masai cattle (pages 49 and 50).

PAGE 42

Have the students research information on the baobab tree mentioned in the story, and relate it to the picture of the tree shown here and on the back cover. Some observers have said that the baobab looks like a tree which is growing *into* the ground with its roots in the air. The picture on the back cover shows a baobab tree in full leaf. Discuss this as an adaptation to the long dry season found in the grassland.

DID YOU KNOW?

The savanna covers over 30% of the African continent. Students might be able to suggest the type of climate this area would experience. The figure on rainfall for their home area will probably be given in inches in an atlas. The problem here is to discover the means of conversion between inches and millimetres.

PAGE 43

Here is an opportunity for the student to

compare his life with that of a Masai boy. The many differences could be listed on the board.

PAGE 44 — 45

1. In the diagrams, those with green, lush, plentiful grass represent the wet season or wet areas. Those with yellow, dry, scarce grass represent dry areas or the dry season.

   The concept illustrated here is *nomadism*: the need to move frequently to find grass and water for the cattle. This movement would need to be more frequent in the dry season as water and grass become scarce.
2. When the students extract the five heavy arrows, they will have a circular pattern which they should relate to their answer in question 1. The arrows show the annual movement of the Masai to obtain pastures and water for their cattle.

   If students have difficulty, offer the following information: The bottom circle represents activity in the months of May, June, July and August. Moving counter-clockwise, the next shows September, October, November; the third December and January, the fourth February and March and the last April, before the cycle begins all over again. The dark branching symbol from each boma represents the path for water and salt.
3. The flower patterns represent the paths taken by the cattle in their daily movement from the boma or kraal. They move to the pastures, water and salt in the morning and return to the protection of the kraal at night.

   The shorter the period of time in one place, the smaller the area grazed, and the further into the dry season. The main reason for moving more frequently is the need for drinking water for the cattle. The later in the dry season it is, the harder it is to find water.

Masai villages (Enkang) are built by women. First a fence made out of thorny branches is constructed as a protection against man-eating animals. Then the individual huts are made out of a skeleton of sticks cleverly interwoven like a wicker basket and plastered with a thick mixture of red clay, cow dung and cow urine. Fresh supplies of these building materials are always handy, to repair cracks in the roof and walls caused by the fierce heat of the sun.

PAGE 46

1. The words list the materials used to build the huts. Roof poles, uprights, and stakes support the other materials and form the framework, which is built first. Long grass and small branches are then put over the framework. Cow dung and mud are mixed to produce the outer, protective covering of the hut. The pictures on the page show this in a deteriorated condition. Hides are used to cover the doorway.
2. It probably takes only two or three days to build a hut such as this, especially for a man with several wives, and/or many children. The man himself does not take part in the actual construction, since this is considered women's work. In many cases, several wives work together to build all the huts which are needed by the tribe.

The main point in questions 3-5 is to make the student reflect on the basic differences between his own home and that of a Masai. He should realize that the home of the nomad is quite different from his own, due to the constant need for moving from place to place.

PAGE 47

2. The home of the Masai is used only for sleeping when the nights during the clear, dry season get quite cool. They are also used for protection during the rainy season. Since there is no winter in Kenya, the members of the tribe live mostly out-of-doors. This should contrast with students' results to question 2, especially in winter.
3. Some suggestions: Smell, muddy floors, absence of windows, small and cramped living space, smoke indoors when cooking takes place there.
4. Answers might include: running water, privacy, electricity, indoor play areas (for rainy days).

PAGE 48

In the Masai tribe, women do most of the hard work. Men lead a relatively "easy" life, except during times of war, when they are expected to fight for their tribe. They are also required to kill a lion singlehandedly to enter warriorhood. This topic is covered on page 38.

For question 7, the major difference would be the more active working role played by men in our society.

PAGE 49

The social structure of the Masai is determined by the ownership of cattle. The more you own, the more important you are considered to be in the tribe. The chief normally has the largest number of cows and would be the top man in the diagram.

If students have difficulty interpreting this diagram, have them put the following numbers over the cows:

top row	— 80
second row	— 40
third row	— 20
bottom row	— 10

PAGE 50

From the time a boy starts to herd animals, he grows in affection for them. He strokes the cows, talks to them and calls them by pet names. When the old folk discuss the qualities of their cattle, it is not the yield of milk that they talk about but the colour of their skins, the beauty of their flanks and the form of their horns. Economic value is certainly not the prime concern of the Masai. Cows are not a substitute for money, as they are among the Bantu. The Masai's extraordinary love of their cattle can only be explained in conjunction with the Masai origin as cattle worshippers.

Usually one Masai family
500 head of cattle, and son
more. Each wife has at least 5 donkeys to help her transport water. To the Masai, a large number of wives is an economic necessity. A man who has a lot of cows must also have a lot of women to milk them. Cows are milked twice a day by Masai women. Special gourds are kept for the purpose. The cows, like humans, are members of the family, and as such they must be brought into the clan by some ritual banding. Have students discuss these ideas.

PAGE 55

If you were to ask a Masai his name, he would never tell you, and would think it typical of you as a stranger to ask such a rude question. To find out a Masai's name, ask his companion; he will tell you without hesitation. Let the class consider the reasons for this behaviour.

Names are very confusing among the Masai. A warrior's friends call him by the name of the ox given to him by his father. His mother uses a babyhood nickname. Do we have different names for our friends?

PAGE 56

Some discussion and research on the subject of a "balanced" diet will make the questions in this exercise more understandable. Because the Masai have one of the most protein-rich diets in Africa, they are lean, have excellent teeth and great strength and stamina. Much of their diet derives from cattle, with only small amounts from cultivated crops such as millet, corn and bananas. Like all nomads, the Masai despise farmers who grow crops instead of raising cattle. Many of the wars they engaged in were against farming tribes such as the Kikuyu.

Since cattle are important as social indicators, point out the fact that beef is eaten only on special occasions and does not make up a regular part of the diet.

A further question which might be considered: Why does the warrior's diet differ from that of the other members of the tribe?

PAGE 57

The section on grasshoppers gives students an opportunity to study the anatomy and habits of a typical insect. Preserved specimens for dissection can be obtained from secondary schools. Students can study the characteristics of invertebrates in general and insects in particular, and contrast them with the vertebrate animals previously examined. A series of slides and pictures, living and preserved animals could be used to develop ideas and skills in classification.

Students should be given the opportunity to study the living animal to see how it eats, breathes and moves. They might collect insect specimens in small jars with grass added.

Masai do not generally eat game, and therefore rarely hunt. When they do, it is with spears, for the lions and leopards that eat their cattle.

ADDITIONAL MATERIAL TO THINK ABOUT

Masailand is large, with 41,000 square miles. Only 150,000 nomads live there and roam freely. Masailand is the richest in fauna in East Africa. Geologically, Masailand is practically untouched. How may this last fact concern conservationists? industrialists? politicians? the Masai?

ADDITIONAL MATERIAL TO USE IN CLASS

The following examples of the Masai vocabulary may be used to put on a play or tell a story.

shield Alongo
spear Arem
gourd Kukuri
sword, knife Alem
here it is Nena
which one Kalou?
how many Kaja?
what do you sell Ainyoo imir?
tell them En-Tiaki!
I am Nanu
for him Te ninye
for you Te yie
head Endukuya
water Engare
danger Batisho
river Oreyiet
path Olkitikoto
bushes Iseroi
stone Osoitto
one Obo
two Aari
three Okuni
four Oongwan
five Imiet
six Ile
seven Oopishana
eight Isyet
nine Oouds
ten Tomon
eleven Tomon o (etc.)
twenty Tikitam
hundred Lip
yesterday Ngole
today Taata
tomorrow Taaisere
this morning Duoo
when Kanu?
tree Olkani
on top of the tree Em boliel
worthog Ol bitir
hyena Ol-ngojina
ostrich E-sidai
eland O-sirua
baboon Olgaldes
lion Olongutuny
rhino Emuny
buffolo Olosowuan
elephant Oltome
blood O-sargei
west En doiyoroto
east Ol-oosaen
south Moikuape
north Kopikop
above Shumata
below Abori
behind Kurum
in front Dukuya
teeth Ilala
bone Oloito
I kill them Kaar kula
ivory En dim
sun Enkolong
gome E-ngues
dry season Ol ameyu
claws Iloisoto
bush country O-Sero
go quickly A-sioyoo
come quickly A-sieku
I do not know Mayolo

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James Forrester, Co-ordinating Editor
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Authors: Gary Birchall
James Forrester
William Mastin
Editor: Robert Read

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